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AUTHOR McDiarmid, G. L.
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ABSTRACT

Referring principally to Indians on reserves, this summary paper discusses the role that poverty, health and nutrition, social conflict, language, and test motivation play in relation to interpretation of test data obtained on Indian children. It is reported that the 2 greatest problems affecting test reliability, validity, and validity of test interpretation in this context are language and test motivation. Approaches to measurement of the Indian child's mental ability that are reported to be promising are discussed. (BO)

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THE HAZARDS OF TESTING INDIAN CHILDREN

Dr. G. L. McDiarmid
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Introduction

The use of the word hazards in the title of this article is deliberate. The word indicates that there is some form of cost involved for venturing into this territory. Most fields have reliable bodies of data whether or not significant differences are found for specific comparisons, wherein one may report with some feeling of closure on analyses, methodology and unique conclusions. Not so for this paper.

Except for anthropological investigations, a few old studies that attempted to correlate measures of I.Q. and the degree of bloodedness of Indians (Garth, 1925) and several studies which illustrated that the achievement of Indian children was considerably lower than that of non Indian children, the literature in this field is sparse. Since Indian studies are becoming popular it seems timely to record some of the idiosyncratic features in this field in order to ensure that misinterpretations of the data will be kept to a minimum.

Because of the cultural distinctiveness of North American Indians and the consequent potential for distortion of conclusions and overgeneralization of test results some people maintain that we have no right to test Indian children. Our counter assertion, and I take it as being valid, is that systematic studies and their associated tests are prerequisite to constructive

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innovation. However we must be wary of stating a position as though it were a prerogative. It would be prudent to interpret the criticism as a necessary reminder of our responsibilities because the onus is on us as the interventionists to show cause and to disclose the assumptions on which every test purports to sort human beings into certain kinds of slots. True, the world of everyday events does this also but the world of testing carries an aura of finality and to refined and deliberate degrees.

It follows that we bear a further responsiblity to ensure that students and others who work with us understand our concern about the limitations of tests so that when they are away from home base they do not convey casual and misleading inferences from data that they are in the process of collecting. Although these remarks are true for all we have an obviously greater social responsiblity towards the members of minority groups who have fewer means of protection from unwarranted generalizations to the whole group.

This paper refers principally to Indians who live on reserves. Similar conclusions might be made about other Indians not urbanized for a generation or so and to those of mixed ancestry. With a few exceptions to be noted, most investigators in this field have not collected sufficient data to be able to make appropriate comparisons.

A 1964 report by a work group of the Society for the Psychological Study of Social Issues (Deutsch, Fishman, Kogan, North and Whiteman) notes that the authors were unable to find test manuals which provided reliability data for specific minority groups. It seems that this condition

still exists for North American Indians. This paper presents some of the probable reasons for such a situation, notes a few promising lines of research which are beginning to appear in the literature, and indicates some hopes for the future.

Hazards Big and Small

I just exposed myself to one of the current but undoubtedly temporary hazards when I expressed the fact that I have been unable to find test manuals which provided reliability data on tests for Indians. Someone may well object and state that precisely that information was filed with ERIC two months ago. I could only reply with a mea culpa; the field is new. But there are more profound problems than lack of citations in the literature.

Our frequently stated intention to remedy the deficits which we discover in our testing through modifications or intensifications of the school program has often led us to disappointments (Perkinson, 1968). Not the least of the antecedent conditions leading to lack of results are pre- and early post-natal. The factors of health and nutrition and the role they play must be considered by those who draw inferences from their data and also by policy makers who may have to make agonizing decisions on the priorities of allocating funds.

The birth rate of Indians is three times that of the rest of our society (Vernon, 1969, p. 198) and they suffer grievous health conditions. In a very thorough study of whites and Indians in British Columbia, Tonkin, Robinson and Kinnis (1971) note

> It is necessary to recognize the importance of the data on Indian health. The significant contribution of this small group of study families to the overall pathology detected in the total study should be stressed. Both quantitative and qualitative, differences were represented by the Indian families examined. The tragedy of poor housing, high pregnancy rates, and significant number of childhood deaths is easily lost in the overall statistics (p. 13).

Employing their own Living Scale these researchers found that 76% of the Indian families in their sample lived below a conservatively estimated poverty level. Although they found that fourteen percent of the children lived in a one-parent home it may be that other areas have a higher ratio.

Only 45% of the Indian children had visited a dentist and only 38% owned and used a toothbrush. Among the pre-kindergarten age group only 25% of the children had ever visited a dentist. The socioeconomic status of the families related closely to measures of dental health, skin diseases, lymph nodes, tonsil and ear problems, skin fold thickness and arm circumference. Grade 1 preparedness measures produced the conclusion that all the Indian children were "at risk."

Hazards of Entry

We all know that it was an accident of history that causes us to refer to the natives of North and South America, who are not Eskimos, as Indians. Since this group name will probably remain in use it will continue to mask the fact that what most people consider to be a homogeneous group

is in fact composed of many peoples. Generalizing from a sample, from one Indian group to all Indians, in the title of articles and in the interpretation of test results is misleading and may actually be invalid. Generalizability is an empirical problem for which reliable answers are needed.

On a practical level it may save one some embarassment to recall that relatively recent historical events, for some it is within living memory, have caused bitterness and hostility between Indians and whites, and also between various groups of Indians. It comes as a surprise to some investigators to learn that establishing contact and cooperation with one group may not automatically transfer to a nearby group. It also comes as a surprise for some to learn that while there are many groups which will accept any Indian person as part of a research team, there are nevertheless such strong incompatabilities between some groups (or perhaps expressed by one group against all others) that even competent and needed native teachers feel that they must move.

Anthropologists are trained to understand such possibilities. But other researchers, in their new-found zeal of social conciousness face some disillusionments unless they become aware of the fact that Indians are as human as the rest of us with a more unfortunate history than most. On the other hand there is the opposite hazard of taking Indians for granted. With a kind of attitude that imperialists have toward colonialists, investigators may move onto a reserve and start their testing program without even visiting the proper Indian authorities. People who have the sensitivity to do more than contact the school or health center and who learn the protocol

of meeting the chief and accord the dignity of recognition to other persons of importance on the reserve will probably be welcomed when they return.

The Hazards of Test Bias

The two greatest problems we face in testing Indians are language and test motivation. They affect the reliability and validity of tests, and the validity of test interpretation.

In one small community there may be people who speak no English, some who speak no native dialect and others who use both languages in varying degrees. Often the young and the old speak different versions of the same dialect. It seems that those who are now in their twenties have dropped prefixes, suffixes, and otherwise altered the spoken form of words in ways that must present problems to young children.

In Canada there is an extra complexity because of the use of French and in the United States because of the use of Spanish. Add to these problems of test validity the further fact that there is a multiplicity of spoken dialects, with very little generalizability across groups even within a narrow geographical region, and we can begin to see the dimensions of the problem.

Many of the dimensions have oblique rather than linear consequences but eventually they all involve children. What effect they have specifically on concept development can only be speculated upon. However, one of the consequences of which we can be certain is that the numbers of people in homogenous sampling groups can be very small. From that fact flow a further set of difficulties.

1) Standardized tests can be administered in a language other than that in which the original appears but the norms of the test must be recomputed for each group. The problems of sampling, time consumption and money are obvious.

2) Results are reliable when subjects can be carefully coached in the methods of doing standardized tests, particularly non verbal tests, if their use of English is sufficient for communication. (Vernon, 1969). It seems to be adviseable to administer subtests in separate booklets and to issue instructions immediately prior to the administration of each subtest. <u>But the person doing the coaching must be aware of the increased potential for tester bias which enters into this situation.</u>

3) Under the best of testing conditions in the usual sense there still remain other problems in the linguistic-concept area both in words and abstract forms. a) Quite by accident Price-Williams (1962) discovered that the Tiv of Africa had no concept of triangles and therefore were not able to discriminate or to manipulate this form. Wober (1967) found that West Africans and West Indians failed to breakdown printed designs and reproduce them with Kohs Blocks. And Shapiro (1960) found a notable tendency among his African subjects to rotate their reproductions. Only by conducting extensive testing over many items will we know whether such idiosyncracies exist among the natives of North and South America.

b) Berry (1966) in a well-designed study has shown that the perception of objects and events vary with certain types of environments. The implications of the study warrant an elaboration of details. He used three groups of 120 persons each, ranging in age from 10 to 40 years, subdivided into urban and land-dwellers. His subjects were members of the Temne tribe in Sierra Leone, Eskimos from Canada's Northwest Territories, and Scottish people who were used as a western control group. In a closure test for discriminating small details, Eskimos performed best, Scots were in the middle, and the Temne were the poorest.

Using Kohs Blocks, Embedded Figures, Colored Progressive Matrices and Morrisby Shapes as intelligence measures he found that the Scots and urbanized Eskimos were at the top; the traditional Temne performed least well. What position would we hypothesize, particularly for projective tests, for the Blackfoot, Shoshone, Hopi, Haida and Mohawk who have clearly different geographical environments--or would we find no systematic differences? The hazards of generalizing from one such group to another will remain until we collect a great deal of data.

c) The following is a problem that I cannot verify yet, but I have indications from Swampy Cree, Woodlands Cree, Ojibwa and Saulteaux all of whom have different languages, that different conditions, or states of production, of an object require that it have a different name. One perfectly bilingual guidance counsellor

told me that he would not "feel right" simply to use the Ojibwa construction in reference to his car. At the time of our conversation he said that he would feel compelled to say "my car with the dent in the front."

When I asked recently what the Ojibwa word is for a quilt that was stretched out on a frame, I was told it was "wah-bu-won." The woman was corrected by two others who said "Not yet; It is tah-tow-gwah-jegun." Since anthropological linguists have done a large amount of work among many Indian groups it should be possible to test the implication that conceptual structure is formed by words that express "something in the process of becoming something else" or a "not-yet-quilt". But the basic hazard of assuming common language structures will always be present for most of us who will never become fluent in any of the Indian dialects. I see this as a very serious problem for those involved in pre-school learning situations where concept formation is most active.

d) A reading consultant whom I visited in Utah stumbled into quite a different type of hazard. She had worried for some time about her inability to test adequately the pronunciation skills of Navaho adolescents. In order to isolate the elements of mis-pronunciations she labored diligently over a full page of nonsense syllables which then was placed in a battery of tests. Two days after she administered her individual test of pronunciation skills a Navaho girl came to the consultant's office to say that the

students had been talking about the test. "You shouldn't use that reading paper" she was told. "It has some Navaho swear words printed on it."

Having learned from this type of experience I have followed the system of double translation. One person takes my set of instructions and test questions and translates them into the appropriate dialect. A second person then translates the dialect back into English, the two English versions are compared, and, if need be, modified.

Hazards in Analysing Motivation

There can be little doubt that a large proportion of variance in test results can be attributed to some form of motivation. Among middle class test takers we have long recognized that scores are enhanced by the performance variable known as test-wiseness and a culturally conditioned achievement motivation. But there are several discrete behaviors included in these variables: the desire to strive to do well; attending carefully to directions; at times, as in a multiple choice test, a willingness to guess or take a chance; a sense of time and competition; and expectations of the consequences of praise and discredit for abstract behavior.

Indian children do not fare very well in these categories. Still reared in an environment where the slowly changing seasons may be as important as the clock and where competitive individualism is given negative reinforcement, if not punishment, it is hazardous indeed to interpret test scores as measures of potential.

There have been a few tests of nAch employing Indians as subjects reported in the literature. The results are scarcely profound: Indian subjects were found to produce low nAch scores. Indeed it is a universal

observation of teachers that Indian children speak very seldom, often do not respond to questions at all and initiate few of the behaviors that correlate with school success. They also speak so softly that it is difficult to understand them. These factors alone can cause difficulties in test administration and interpretation.

In an attempt to understand the complex of variables that underlie Indian behavior Florence Kluckholn derived a test of value orientations from the theory that she published in 1950. Using Zuni, Mexican Americans and Anglo Americans in New Mexico (1952) she confirmed her hypotheses and presumably the utility of her instrument by showing that Anglo American and Indian genotypic value orientations are almost diametrically opposed. The Anglos were judged to have orientations that were labelled active rather than passive, individualistic rather than collective, future-rather than present-oriented. The Zuni were shown to prefer items which indicated the opposite motivations: passive towards nature and its events; collectivistic rather than individualistic; present with some degree of past orientation towards time. Several people followed her lead with amended versions of the interview test (eg. Kitchen, 1966; Gue, 1967; Parry, 1967).

Since I wished to investigate the constituent elements of each of these orientations with the possibility of understanding antecedent conditions of children's motivations in school, I decided to do an extensive item analysis on tests administered to a large random sample of Ojibwa Indians. I had the test double translated, chose my interviewers and identified the people to be interviewed by stratified random selection from a map of the

reserve. Two weeks before the day on which we decided to commence testing I was asked to be an outside examiner for a thesis which used a version of the value orientations test (Clarke, 1968). To be brief this new investigation showed the test to be so unreliable in a test-retest application (.24) that I could not justify the further expense of proceeding with my own testing. Because I did not want to spend the next few years developing a reliable test I abandoned that particular approach. Observation would have to serve. Such are the hazards in research which are not reported often enough in the literature to warn the neophyte that not all results come out at the .001 level of significance.

McDiarmid and Narrol (1970) conducted a behavior modification program for six weeks during a summer vacation in a direct attempt to enhance motivation and thereby to increase achievement on several measures of reading, spelling and arithmetic. We employed 9 teachers and gave them daily training sessions in theory and technology. The subjects were 60 Ojibwa boys and girls in grades 4, 5 and 6. A token economy system was employed with paper money reinforcements, scaled according to achievement, being distributed at the end of every half hour working period. A wide program of sports, table games, arts and crafts and bus excursions was available every afternoon where the paper money bought activities which were chosen by each individual.

The children in grades 4 and 5 made significant gains in multiplication and addition but not in subtraction or division and the children in grade 6 made significant gains in multiplication and addition of whole numbers and subtraction of common fractions. Reading and spelling measures showed no differences between pre-and post-tests. No reasons could be gleaned

from observations or other data that were collected to offer possible explanations for the differential results. None of the teachers employed identifiable behavior modification procedures during the following school year.

The experimenters differed in their views as to whether this was a promising line of attack on the dropout situation among Ojibwa school children. It is my opinion that the schools should reinforce learning through the existing supportive structure of interpersonal relationships among Indian children instead of introducing subtle techniques of competition. Moreover it was my observation that the children whose attendance was best and who also maintained an interest in their work had parents who encouraged their children to attend. This observation is confirmed by Vernon (1969) who states that when the factor of parental interest and aspirations is held constant, "other factors often cease to show any significant effects" (p. 66), and by the well known Coleman Report.

Although it is too involved a question for an extended discussion in this paper, there is an added consideration which must be considered in the daily operation of the school program. The school as a socializing agency of society has manifold behaviors to reinforce. For teachers who are sensitive in their work these must be selectively applied, often at simultaneous occasions. In certain cases achievement in a school subject may be deemed less important than some other variable. The issue of atomistically identifying behavioral objectives is an honorable one in science, particularly in physics on which behaviorism is so closely modelled, but there is a

recognized limiting point in physics which may identify the hazards of generalizing psychological variables from small groups to school systems:

> Wherever a system is really complicated, as in the brain or in an organized community, indeterminacy comes in, not necessarily because of **h** [Planck's constant] but because to make a prediction so many things must be known that the stray consequences of studying them will disturb the status quo,, which can never therefore be discovered. History is not and cannot be determinate. The supposed causes only may produce the consequences we expect. (Italics in original, Clark, 1971, p.X.)

Personal Hazards

As strange as it may seem in this, the eighth decade of the twentieth century, a great deal of indifference still exists towards the problems which Indians encounter in North American society. There have been many occasions when I felt that I understood the institutional problems which Watson (1968) described in his struggles to pursue the connecting links of the double helix in genetics.

I have been asked if I "really wanted to risk my career on those people." I have had proposals "evaluated" by people who very obviously knew nothing about Indians. None was so blatant in exhibiting his ignorance in this areas however as one who, when querying a procedure used as an example of nursery school activities in the kitchen, asked "Do Indians eat eggs and sausages?"

On the other side of the spectrum lie those who have an immensely unrealistic, romantic view of the way that Indians ought to live. Of such people the Navaho have a saying, "They want to put us back in our blankets." Thus it came to pass, eighteen months after I had decided not to pursue

a behavior modification program with Indian children, that an underground magazine published an article, grossly and perhaps libelously misrepresenting the facts in the experiments, accusing me of wiping out Indian culture. There is undoubtedly an appropriate Latin phrase which would add a classical touch to the irony of these irreconcilable personal hazards.

Possible Constants in the Flux

For a number of obvious reasons, the measurement of a valid and reliable generalized Intelligence Quotient occupies a central position among the concerns of those who work with minority groups. Since it is now general knowledge that no test is culture free, a number of people are trying to develop some reliable definition of fairness or reduced effects in the testing of Indian children.

Others are less concerned with a unitary definition of intelligence than they are with testing the hypothesis that patterns of mental ability exist and can be tested reliably. For some, notably those who follow Piaget, it is sufficient to demonstrate that certain characteristics are universally and developmentally sequential. For others of a more phenotypical orientation there is more interest in patterns which are measured by a greater number of concrete items even if scores in these patterns are distributed differentially between groups. The difference between the latter two points of view seems to be one of you pays your money and you define your own construct validity.

To remain consistent with the tenor of this paper it should be noted here that the desire for some sort of measure of intelligence is not universal. Because of unwarranted generalizations from published data,

a failure on our part to convey the assumptions underlying observational and numerical descriptions of behavior; and because members of minority groups have demonstrable reasons for being concerned about descriptions that appear in print (McDiarmid and Pratt, 1971) one may encounter personal and institutional resistance.

Many Indian groups are now making their cooperation conditional upon a satisfactory explanation of what is entailed by a proposed investigation and by some assurance that results of the research will not only not be detrimental but will be beneficial to them. It was Spindler and Spindler (1957) who noted that "no area in the world has been so combed over by anthropologists as has North America" both for cultural and psychol-cultural data on Indians (p. 147). The Indians are highly justified in asking for a quid pro quo.

R. S. MacArthur and several students at the University of Edmonton in Alberta (1960; 1961; 1963; 1964; 1967) and Philip Vernon (1966; 1969) have in recent years carried out a number of investigations in unitary measures of intelligence on Indian and Metis children. (Historically Metis was a term applied to Indians with French and Indian ancestry but the meaning now carries over to other ancestral backgrounds with some Indian ancestry.) Although all the studies report intrinsically interesting findings, for our purposes it must suffice to report that Raven's Progressive Matrices were found to exhibit consistent and minimal relationships to socioeconomic status, no differential evidence of cultural bias by item, and moderate correlations with school marks. The Cattel test of g and the Lorge-Thorndike

Figure Analogies subtest showed somewhat the same results. However West (1962) found that the degree of cultural bias may vary in one test at different levels in school. He therefore recommended intensive item analyses and possible recombinations of items and subtests as a result of his factor analysis. Both West and Vernon (1966) confirmed MacArthur's findings on the Progressive Matrices.

Two Ontario studies of Indian children (Cargill, 1970 and Wagman 1970) confirmed the existence and sequence of Piaget's stages while at the same time demonstrating the expected results below the norms on other intellectual measures. Cargill's subjects ranged between 4 and 24 months. She used the Gesell Developmental Schedules as a measure of infantile development. Wagman's findings with children of a mean age of 5 years showed a delayed pattern of cognitive development on the Piagetian tasks with some decrements in expected performance. Factor analysis indicated that measures of flexibility of hindsight and foresight preceded Piagetian conservation development. Wagman's intragroup comparisons were made with measures from the Stanford-Binet Intelligence Scale and the Goodenough-Harris Drawing Test.

A promising approach to the measurement of mental abilities was taken by Lesser, Fifer and Clark (1965) although their four groups did not include Indian subjects. Instead of attempting to find items that did not discriminate between cultural groups, they employed measures that were expected to give a greater amount of <u>differential</u> information. In justification they cited Lorge (1953).

> There is no virtue in developing instruments so blunted that they decrease the amount of information. Perhaps the best method for reducing bias in tests of intelligence is to use them with the full knowledge that endowment interacting with opportunity produces a wide range of differences. Appraisal of the variation of different kinds of intellectual functioning requires many kinds of tests so that the differences can be utilized for the benefit of the individual and for the good of society. Intellectual functioning certainly does involve the ability to learn to adjust to the environment or to adapt the environment to individual needs and capabilities by the process of solving problems either directly or incidentally. Such a concept recognizes a variety of different kinds of problems. The full appreciation of the variety of aptitudes and the development of adequate methods for appraising them, should in the long run, ultimately lead to the production of enough information to eliminate bias.

Four mental abilities, Verbal, Reasoning, Number facility and Space Conceptualization of 6 and 7 year old boys and girls in four ethnic groups (Chinese, Jewish, Blacks and Puerto Rican) were tested. Because of a 4 x 2 x 2 analysis of covariance design their findings were complex but they confirmed their hypothesized pattern differences, for example, on verbal ability Jewish children ranked first, Blacks second, Chinese third and the Puerto Ricans last but in Space Conceptualization the Chinese children ranked first, Jews second, Puerto Ricans third and Blacks fourth. The authors state a conclusion that is significant for the purpose of the present paper.

> The importance of the mediators associated with ethnicity is to provide differential impacts upon the development of mental abilities, while the importance of the mediators associated with social class is to provide pervasive (and not differential) effects upon the various mental abilities. This conclusion allows selection among the several explanations offered to interpret cultural differences upon intellectual activity... (p. 83).

We might hope for a similar study and similar respect paid to the differences that exist among the children of the North American Indian peoples and the rest of our society.

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